CAPE SPENCER LIGHTHOUSE
Glacier Bay National Park and Reserve
Cross Sound
Yakutat vicinity
Skagway-Yakutat-Angoon Division
Alaska

HAER No. AK-24

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD
Alaska Regional Office
National Park Service
2525 Gambell Street
Anchorage, Alaska 99503

HAER
AK
18-YAKU.V
1-

HISTORIC AMERICAN ENGINEERING RECORD

CAPE SPENCER LIGHTHOUSE

HAER No. AK-24

I. General Information

Location: Cross Sound, Yakutat vicinity, Glacier Bay National Park and Preserve, Skagway-Yakutat-Angoon District, Alaska. 58 degrees 11' latitude; 36 degrees 38' longitude. USGS Quad Sitka. UTM: 8.403880, 6451700.

Date of Construction: 1924-1925.

Present Owner: United States Coast Guard, 17th District.

Present Use: Aid to navigation.

Significance: The first Alaskan lighthouse equipped with a radio beacon, the Cape Spencer Lighthouse retains the highest degree of integrity of all Alaskan lighthouses. Its construction at the northern outlet of the Inside Passage shipping lane marked a major shift in commercial development from the southeast region to the south-central region of the future state of Alaska.

Historian: Bonnie S. Houston, August 1989.

II. History

Situated on a conspicuous land head off the northern shore of the entrance to Cross Sound, the Cape Spencer Lighthouse provides navigational aid to ships passing through the fog ridden storm tossed waters of the Pacific Ocean to the safety of the protected waters of southeast Alaska's inside passage. The northern most outlet from these waters, Cross Sound Xservedas the major shipping lane from the ports of southeast Alaska and Puget Sound to southcentral Alaska. The construction of the Cape Spencer Lighthouse in 1924-25 signified the shift in the center of development from southeast Alaska to southcentral Alaska. In 1926 the Cape Spencer Lighthouse became the first lighthouse in Alaska equipped with the latest innovation in navigational technology, the radio beacon. Although the four-man operating crew was replaced with automated equipment in 1974, the lighthouse maintains its original integrity of design, setting and function.

Cape Spencer Lighthouse lies within the boundaries of the Glacier Bay National Park and Preserve. Perched atop a lush green covered rock amid crashing waves, the lighthouse offers an undisturbed view of the Pacific Ocean, Cross Sound and the towering peaks of the Park. Sighted in 1741 by Russian explorer Chirikof, nearly 150 years later the works of naturalist John Muir popularized the snow covered mountains and glaciers of Glacier Bay. In 1925 the same year that Cape Spencer Lighthouse went into service, President Calvin Coolidge designated the national monument for the study of glaciers and their surroundings.[1]

At the time of the 1867 Alaska purchase, aids to navigation existed only in areas most often frequented by Russian ships. A light guided ships in to Sitka Harbor and number of buoys marked the Kodiak Harbor. After purchase the U.S. government followed suit, from 1867 to 1878 the Army maintained the Russian light atop Baranov's Castle in Sitka Harbor. Slowly as expansion dictated, more aids to navigation were placed in Alaskan waters. In 1884 the federal government placed 14 buoys along the inside passage in southeast Alaska. By 1895 the aids to navigation in Alaskan waters consisted of 57 buoys, 26 daymarks, and the light in Sitka Harbor.[2]

The Klondike Gold Rush and subsequent development of southeast Alaska led to the installation of numerous aids to navigation in the hazard ridden waters of southeast Alaska's inside passage. Increased commercial traffic to the gold fields resulted in a dramatic rise in the number of shipwrecks. In 1898 and 1899 46 vessels were lost in the waters of southeast Alaska. The public outcry in response to these disasters prompted the appropriation of $100,000 for navigational aids in 1901 and an additional

$500,000 between 1901 and 1903.[3] By 1905 navigational aids in Alaskan waters included 15 lights, eight fog signals, 68 buoys, and 30 daymarks. Of the 15 lights, eight were light houses constructed in southeast Alaska.

The 1923 authorization of funds for construction of the Cape Spencer lighthouse marked the end of a twenty year struggle for the establishment of a major navigational aid in Cross Sound. In 1903 with the Bureau of Lighthouses recommended the construction of a lighthouse station at the entrance to Cross Sound. However the Alaskan coastline was 26,000 miles long, poorly charted and unmarked, the aids to navigation were only constructed as expanding development and commercial activity created a need for a safe transportation route. Although the entrance to Cross Sound presented a hazard to transportation, the development of other areas of Alaska precluded the establishment of a major aid to navigation.

With the expansion of development to the southcentral region of Alaska additional navigational aids were required. On Feb. 19, 1906 the U.S.Senate acted upon the 1903 recommendation of the Bureau of Lighthouses and passed legislation authorizing the establishment of a light station and fog signal at Cape Spencer but did not fund the project.[4] In response to this measure President Theodore Roosevelt signed an executive order on March 2, 1907 creating the 3,840 acre Cape Spencer Lighthouse district:

> "All that portion of head land of which Cape Spencer (entrance to Cross Sound, Alaska) form the southerly extremity lying south of the parallel 58 degrees 14 minutes north latitude, together with all outlying islands and including all land on both sides of the inlet known as Dick's Arm and south of the said parallel". [5]

As the development of Alaska expanded the need for a light at the entrance to Cross Sound became more pressing. Exportation of copper from the Kennicott Copper Mines necessitated the construction of two lighthouses in Prince William Sound and altered the main transportation route from the west coast to southcentral Alaska. In 1909 Captain Charles E. Peabody, the president of the Alaska Steamship Co. the major shipping line, initiated a new route for vessels transporting copper.[6] Instead of traveling along the Pacific Coast, ships entered the relatively calm and well marked waters of the inside passage at Cross Sound. In October 1913, to provide for the safety of the increased traffic, the newly reorganized Lighthouse Service erected an unattended light at Cape Spencer. Estimated to cost $2710, the 90' automatic beacon contained a 375 mm. lens with 1 cubic foot burner powered by

acetylene in acetone that flashed a white light of .5 seconds duration every 2.7 seconds.[7]

After Alaska achieved territorial status in 1912, a series of events favored the construction of an attended lighthouse at Cape Spencer. In 1914 the Alaska Railroad Act and the Alaska Coal Leasing Act opened the coal lands to development and authorized construction of a railroad to transport coal to the port of Seward in Prince William Sound. The traffic created by the exportation of coal combined with the copper related traffic, increased the need for a more effective aid to navigation in Cross Sound.

The territorial government of Alaska and commercial interests supported the construction of a lighthouse at Cape Spencer. In 1919, on behalf of the Ship Masters Association of Seattle, Senator Miles Poindexter of the State of Washington lobbied the federal government in support of a full fledged light at Cape Spencer. Citing the hazardous conditions in Alaskan waters that increased insurance rates and endangered cargo and passengers, Poindexter prevailed upon George R. Putman, Commissioner of Lighthouses, to approve the construction a light and fog station at Cape Spencer.[8]

In 1919 plans for construction of a light station and fog signal were completed, but World War I delayed the actual construction. Completion of the Alaska Railroad in 1923 created a dramatic increase in ocean traffic from southcentral Alaska and provided the incentive needed fund the construction of the lighthouse at Cape Spencer. In 1923 the 16th Lighthouse District headquartered in Ketchican began Xacceptingbids for the construction and outfitting of the lighthouse.

August 29, 1923 the Light House Board accepted a bid of $8975 for Helical Bar Lantern from the Ellicot (sic) Machine Corporation. A 3rd order 4-panel Fresnel lens, costing $7850 was ordered from the Barbier, Bernard, & Turenne Corporation of America. January 5, 1924 the Lighthouse Service advertised for bids for second hand 65' power boat and heavy duty gas engine of approximately 75 hp.. March 1924 they accepted a bid by I.P. Rasder for $9,690. Jan 23, 1924 the sum of $1125 was authorized to purchase drum hoist and on Feb. 5, 1924 the Lighthouse Service accepted the bid of Cylde Co.. February 29, 1924 the King Bothers bid for the steel derrick was accepted. March 26, 1924 the Lighthouse Service accepted bid from Pennsylvania Pump and Compressor Co. for composer gas engines. April 2, 1924 the Board accepted bid from Willson (sic) Sylvester Co. for lumber. Nov. 1923 the Lighthouse Service estimated the cost for the pedestal and clock work for the illuminating devise at $2500. Feb. 13, 1924 Board estimated the cost for one type F diaphone from Diaphone Signal Co. at $1193. In 1924 the lighthouse district began purchasing equipment and supplies for the Lighthouse

station. Some of the equipment included the gasoline hoist purchased from Washington Iron Works for $3,030.50, the steel reinforcing bars from Pacific Coast Co. for $1,066.91, and 800 lbs. Portland Cement from Balfour Gutherie Co. for $2,080.[9]

In the spring of 1924 construction got under way on the Cape Spencer Lighthouse station. June 10, 1924 the lighthouse tender Cedar left Ketchican with a construction crew to begin excavation for the lighthouse. Shortly there after the vessel Lummi II (later renamed the Alder) delivered the construction crew to the site. The lighthouse tender Fern transported building materials to the site.[10] By September 1924 with the excavation for the lighthouse foundation completed, the lighthouse station consisted of hoist equipment, boat house, blacksmith shop, wharf, tram and tram way.[11] On May 1, 1925 construction work resumed at the site. The end of the fiscal year saw the completion of the foundation for the main building. November 11, 1925 marked the installation of the illuminating device which went into service on December 13. In the summer of 1926 crews returned to Cape Spencer to install the radio beacon which became operational July 14, 1926. Financed by three separate allotments of money the completed lighthouse station cost a total of $174,965.[12]

In a 1925 press release the Department of Commerce heralded the Cape Spencer Lighthouse as "the most important protection for shipping Xin Alaska in recent years. The lighthouse marks the principle and main entrance from the Pacific Ocean into the channels of southeast Alaska. It will serve as guide for all ships from southeast Alaska to Prince William Sound, Alaska Peninsula, and the Aleutian Island in addition to the majority of traffic from Puget Sound and the Pacific Coast that uses these channels."[13]

Cape Spencer Lighthouse, like all aids to navigation in the United States fell under the jurisdiction of the Lighthouse Service. In 1939 the Lighthouse Service joined with the US Coast Guard. Formed in 1915 by the merger of the Revenue Cutter Service and the US Life Saving Service, the Coast Guard became responsible for the establishment and maintenance of all aids to navigation. Until 1974 the Coast Guard provided full time attendants for the lighthouse. Maintained by the Coast Guard Aids to Navigation Team (ANT) since automation of the lighthouse, a crew visit the lighthouse every four months.

Description:

Cape Spencer Lighthouse station sits atop an 88-foot rock projection approximately one mile off the coast of Cape Spencer in the stormy waters of Cross Sound 90 miles north of Sitka. The 51' x 62' reinforced concrete building supports a 25' high, 14' x 14'

concrete tower. Atop this tower, 105' above the water, a circular lantern with diamond-shaped glass panes houses the light. In addition to the lighthouse building the station includes a boathouse, wharf, derrick, two hoist houses, tramway, radio tower and helipad. Despite alterations made to accommodate modern technology or repair weather damage, the lighthouse station maintains its original integrity of function and appearance.

The one-story lighthouse building houses the fog-signal and radio beacon room, keepers quarters, in addition to the light. Constructed almost entirely of reinforced concrete, one of the first steps in construction entailed blasting away the rock to create a relatively level spot. The partially exposed basement, constructed to accommodate the irregular surface of the island, consists of several different levels including exposed rock on the eastern end. Accessed from the outside through a two-panel door with fixed transom in the east side, the basement contains a coal storage room, boiler room for the hot water heating system, and cisterns capable of holding 30,000 gals. of water. (See attached drawings) Since automation the fog-signal equipment and radio beacon reside in a fiber glass hut outside the main building. The fog-signal/radio room now serves as a storage room. In 1958 a cistern replaced the coal storage room.

The main floor of the station contains four bedrooms, a bathroom, kitchen, living area, and generator room in addition to the former radio & fog signal room and fuel tank room. A staircase in the service room in the center of the building provides access to the basement or the tower. The interior walls in the living area are furred out, covered with asbestos, wood, and paint. The original hardwood that covered the trowel finished reinforced concrete floors in the bedrooms has since been covered the tile. Eleven double hung two-over-two light windows grace the west side of the building and four the south side. The east side of the building contains five windows of the same type, a two-paneled pair of doors, one two-panel door and one fixed single-unit window with two-light transom at the top. Located in the north end of the building the main entrance is though a small vestibule by means of a two-panel door flanked by four-light windows and topped by a fixed transom. Originally two double two-over-two light windows flanked the vestibule. In 1958 the renovation of the kitchen caused the east window to be enclosed. All window sashes and exterior doors are constructed of wood. (See attached drawings)

Prior to automation in 1974, the lighthouse served as home for three keepers and radio operator for a year at a time. The duties of the crew included a six-hour watch every 24 hours as well as regular maintenance of the fog horn, radio beacon light and other equipment. A coal powered Mills-type hot water system with a 700

gal. hydropnuemetic storage tank equipped with a 2 h.p. pump heated the building.[14] The water for the heating system and for domestic use is collected on the roof of the building and stored in cisterns in the basement. Frequently buffeted by winds up 100 mph, the only escape from the island was on the cutter that delivered supplies every six months. Today the Coast Guard services the lighthouse by helicopter.

The illuminating devise resides in the short tower that tops the building. The tower contains a pair of double hung windows on each side except the north side which sported a small two-panel entrance door. A narrow staircase leads from main floor up through the tower to the glass enclosure that houses the light. The original 110,000 candlepower white light flashed every 10 seconds and fog signal sounded every 30 seconds.[15]

The illuminating devise at Cape Spencer Lighthouse consisted of a kerosene powered light with in a glass lens. The Helical Bar Lantern produced by Ellicot (sic) Machine Corporation consisted of a one-cylinder lantern with cast iron base and bronze helical bar glass sash. The X55 m.m., 10-volt light operated at maximum brilliancy for 16 hours. Supplied by Barbier, Bernard & Turenne Corporation of America, the 3rd-order Fresnel lens consisted of four 90-degree panels, seven central drum elements, eleven elements above and four elements below with a focal length of 50 c.m., 140 c.m. in height. The lens rotated twice a minute powered by a weight driven clockwork drive located in a round cement shaft that extends from the light to the basement.[16]

During thick fog the radio beacon sent a signal every 60 seconds, followed by 60 seconds of silence, on a frequency of 300 kilocycles (1,000 meter wave). The signal sounded daily during clear weather between 9-9:30 A.M. and 3-3:30 P.M., and during the first 15 minutes of every even-numbered hour from 10 P.M. to 6:15 A.M.. The radio beacon utilized two eighty-foot radio towers and several hundred feet of copper wire ground system to transmit its signal. A radio transmitter installed at the same time operated with the call letters WWEH. The radio equipment cost $7,965.[17]

When lighthouse station began operation in 1925, the station included a steel derrick and hoist house; tramway and hoist house; wharf; boat house, blacksmith shop, and small storage building. Constructed of wood, the wharf, boathouse and derrick house are situated at the north end of the island below the lighthouse. Situated on the west side of the dock, the 5-ton capacity stiff-leg steel derrick with ball wheel and 80' boom was powered by a 15 h.p. double friction gasoline hoist, steel derrick had an 80' boom.[18] The tramway, eight-foot long cars on a four-foot track powered by a single-drum electric hoist engine, runs up the hill

from the wharf to the 10' 3" x 10' 1 1/2" concrete hoist house on the east side of the lighthouse. In the 1940s a more reliable diesel engine replaced the gasoline engine. The storage building no longer exists. All that remains of the blacksmith shop is the concrete foundation.

V. Modifications in Structure:

Although weather has damaged the wooden structures on the island, the main building remains intact and unaltered except for changes necessitated by technological advances. The frequency of signals and the intensity of the light have been altered. The living quarters have been remodeled but the most drastic changes occurred when the lighthouse was automated.

The illuminating device has been changed several times to meet modern standards. In 1932 with the installation of diesel generators to operate the radio equipment and the light, an electric light bulb replaced the original acetylene light. The generators charged a bank of 54 batteries that operated the light. The 200 watt bulb provided a brighter light and was safer to operate. Lit continuously, the light made one revolution per minute. In May 1958 when the station converted from DC to AC power, the light bulb was replaced with a 1000 w, 120 volt, PS-52, clear, C-7A filament light bulb that produced 1,520,000 candlepower.[19] The lens speed was increased to 2 rpm. The light flashed every 7.5 seconds for .5 seconds. These changes increased the visibility of the light increased by 75%. In 1959 the installation of a different bulb doubled the amount of light produced. The same year the original clockwork, weight driven lens drive became inoperable. Although retained as a support for the light until automation,[20] an electric motor was installed to operate the light.

1958 marked renovation of the interior of the lighthouse building. Transient sleeping quarters replaced the fuel tank room. The generators were replaced with newer models and the bank of 54 batteries were removed. The installation of a modern kitchen dictated the removal of the coal cook stove and altered the entrance to the bathroom and neighboring bedroom. The removal of the store room adjacent to the staircase expanded the living space. (See attached drawings)

Beginning in 1936 alterations and additions have Xchanged the appearance of the island. In 1936 storm damage dictated the replacement of the boat house, derrick hoist house and wharf. Situated on the east side of the somewhat smaller wharf, the 29'4" x 41' 3" frame boathouse contains two windows on the north and south sides. Covered by a shingled hip roof, a 9'10 1/2" double

door provides access to the structure. Reconstructed on the same site, the hoist house measures 12'2" x 15'3 3/4" with a 5' x 4'11" entry way. 1961 saw the replacement of planking on the wharf.

1959 marked the installation of a new radio beacon ground system and antennae. Consisting of two triangular cross-section steel towers approximately 80' high with two RO-148/U coaxial cables and a #10 Parkway power cable between the antennae tuning unit and the communications room. A new receiving antennae was installed as well as 35-foot whip antennae for radio communications. A new power distribution panel was also installed along with necessary electronic equipment. In 1966 a helipad was constructed on the island. The construction of the helipad necessitated the removal of one of the radio towers. In 1987 80' fiber glass antennae replaced the remaining tower.

In 1974 the station became fully automated. Automation required the removal of Fresnel lens and the installation of modern equipment. A DCB-24R rotating beacon equipped with a 100,000 watt, 120-volt bulb provides a 3,500,000 candle power white light that flashes for .09 seconds every ten seconds. A 250 m.m. emergency light adorns the top of tower.[21] In 1975 the Coast Guard loaned the original lens and clockwork drive to the Alaska State Museum in Juneau. Three fiber class huts were placed on the island to house the navigational and radio equipment. Connected to the Aids to Navigation (ANT) division of the US Coast Guard in Sitka, the equipment is monitored constantly. The lighthouse no longer houses a full-time crew. Instead the ANT crew visits the lighthouse three times a year to preform routine maintenance of the equipment.

The lighthouse station holds the secrets of its past. Copper ground wires green with age and exposure criss-cross the rocks. The remains of the original red brick foundations for the wharf pilings lay hidden under the wharf. At low tide the litter that has accumulated over the years appears in the rocks and crannies of the island. Unused for years the steel derrick sprang back to life with the installation of a new cable. Although the ground is saturated from age old oil spills, an amazing variety of vegetation flourishes.

Although the Coast Guard maintains the lighthouse station, signs of neglect are apparent The plaster on the interior walls is deteriorating and flaking off in large chunks. The few remaining iron railings are rusted and unsafe. Although deteriorating from age and the lack of heat in the building, the building remains structurally sound, a tribute to the quality of the original construction.

On December 12, 1975 in recognition of its historical significance to the State of Alaska, the Cape Spencer Lighthouse was placed on the National Register of Historic Places.

End Notes

1. For more information on the creation of Glacier Bay Monument see History of Glacier Bay National Monument, Bruce Black, Alaska, 1957.

2. Brown, C.M. 1974, 3,5-6.

3. Ibid

4. Senate Act 2705, 59th Congress, February 15, 1906

5. Executive Order, March 2, 1907.

6. MacDonald, Lucile. 1984, p. 11.

7. 5/26/1911, Letter from Office of Lighthouse Inspector, 16th District to the Commissioner of Lighthouses, Lighthouse Service, Department of Labor (Library of Congress, Record Group 26, Light House Board Records, File 9092)

8. 5/25/1919, Letter from Senator Miles Poindexter, US Senate Expenditure in the Interior Department Committee, to George R. Putman, Commissioner of Lighthouses (Library of Congress, Record Group 26, Light House Board Records, File 9092)

9. Index to File 630-E (Library of Congress, Record Group 26, Light House Board Records, File 630.

10. Foreman's Log, Cape Spencer Lighthouse, 17th XDistrictCoast Guard Files.

11. Report of the Commissioner of Lighthouses, 1925. Bureau of Lighthouses, Washington, 1926, p. 29-30.

12. Report to the Secretary of Commerce, Bureau of Lighthouses, Washington, April, 1927, p. 25.

13. November 17, 1925, Department of Commerce Press Release (Library of Congress, Record Group 26, File 630-E)

14. Index to Files, (Library of Congress, Record Group 26, File 630-E)

15. Commissioner Report, Lighthouse Service Bulletin, Department of Commerce, Washington, 1926.

16. 11/17/25, Lighthouse Service Bulletin, Department of Commerce, (Library of Congress, Record Group 26, File 630-E).

17. Index to File 630-E, (Library of Congress, Record Group 26, File 630-E).

18. Index to File 630-E, (Library of Congress, Record Group 26, File 630-E).

19.See attached drawings for details.

20.Lighthouse Service records

21. Coast Guard records

Bibliography

Alaska Transportation Company. Summary of the Alaska Shipping Problem, Seattle, Washington, 1947.

Bixby, William. The Track of the Bear, David McKay Co. Inc., New York, 1965.

Black, Bruce W.. History of the Glacier Bay National Monument, Alaska, 1957.

Brown, C.M.. Aids to Navigation in Alaska History, Office of Statewide Cultural Programs, Alaska Division of Parks, Department of Natural Resources, Nov. 1974.

Commissioner's Report, Lighthouse Service Bulletin, Bureau of Lighthouse, Department of Commerce, Washington, 1923-1927.

Floherty, John J.. Sentries of the Sea, J.B Libbincott Co., New York, 1942.

Gibbs, James A.. Sentinels of the North Pacific, the Story of the Pacific Coast Lighthouses and Lightships, Binford & Mort Pub., Portland, Oregon, 1955.

Hekrdle, Captain XKevinD., Dangerous Passage: Gold Rush Shipwrecks of 1898, Alaska Historical Commission Studies in History No. 194, June 1986.

Holland, Francis Rose. America's Lighthouses, Their Illustrated History Since 1716, The Stephen Greene Press, Brattleboro, Vermont, 1972.

Kauffman, John M.. Glacier Bay National Monument, Alaska, A History of its Boundaries, US Department of the Interior, National Park Service, Washington, D.C., June 1954.

Lighthouse Service Records, Library of Congress, Record Group 26, Files 9092 and 630-E.

MacDonald, Lucile. Alaska Steam; A Pictorial History of the Alaska Steamship Company, Alaska Geographic, Volume II, #4, 1984.

Nautical Archaeology Shipwreck Survey Vessel Record, State of Alaska, Department of History and Archaeology, Anchorage, Alaska, May 5, 1986.

Newell, Gordon, editor. The H.W. McCurdy Marine History of the Pacific Northwest, The Superior Publishing Co., Seattle, Washington, 1966.

Reed, Byron L.. Contribution of the Coast Guard to the Development of Alaska, U.S.Naval Institute proceedings, May, 1929, pp. 406-410.

Sea in Alaska's Past Conference Hearings, History and Archaeology Publication Series No. 25, Office of History and Archaeology, Alaska Division of Parks, Nov. 1979.

Shiels, Archie W.. A Short History of Transportation to and within the Territory of Alaska, 1867-1908, Typescript, Alaska Historical Library, Juneau, 1950.

Smith, Darrell H.. The Coast Guard, Its History, Activities and Organization, The Brookings Institution, Washington, 1929.

Smith, Roland Ryder. "Sea Lanes of the North", Alaska Life, May 1946, pp. 12-13,24-25.

Stirling, Dale. Sourcebook of Alaska Shipwrecks, 1786-1932, Heritage North Publications in History No. 1, May, 1984.

Strobridge, Truman R.. Chronology of Aids to Navigation and the Old Lighthouse Service, 1716-1939, US Coast Guard, Public Affairs Division, Washington, D.C., 1974.

Thrasher, Pat. "Lighthouses Along Alaska's Inside Passage", Alaska, July, 1974, pp. 12-13.

U.S. Department of Commerce, U.S. Coast Pilot, Pacific Coast Alaska; Dixon Entrance to Cape Spencer, 17th Edition, National Oceanic and Atmospheric Administration, National Ocean Service, Washington, D.C., January, 1986..

Wright, E.W., editor. Lewis and Drydens Marine History of the Pacific Northwest, Superior Publishing Co., Seattle, 1967.

Zeusler, Fredrick A.. "Shipwrecks in Alaskan Water", Explorers Journal, Oct. 1960, pp. 23-27.